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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/737,042	10/30/1996	BJORN HEED	C-35620	4727

7590 06/04/2002

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EXAMINER

LEO, LEONARD R

ART UNIT PAPER NUMBER

3743

DATE MAILED: 06/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 08/737,042	Applicant(s) Heed
Examiner Leonard R. Leo	Art Unit 3743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on Feb 26, 2002

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

4) Claim(s) 5 and 7-11 is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 5 and 7-11 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some* c) None of:

- Certified copies of the priority documents have been received.
- Certified copies of the priority documents have been received in Application No. _____.
- Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____

4) Interview Summary (PTO-413) Paper No(s). _____
5) Notice of Informal Patent Application (PTO-152)
6) Other: _____

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DETAILED ACTION

The amendment filed February 26, 2002 has been entered. Claims 5 and 7-11 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5 and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over ACV (SU 800,500) in view of Hultgren.

ACV discloses a recuperative heat exchanger comprising a casing having inlet and outlet ports 2-5; a heat transfer package having a plurality of connected rectangular planar elements with a corrugated pattern extending the entire length and width thereof, the planar elements being folded in an accordion-like manner along fold lines 7; but does not disclose corrugations greater than 45 degrees with respect to the longitudinal flow direction.

Hultgren discloses a heat exchanger comprising a casing 2 defined by top and bottom ends 3 and lengthwise 5 and widthwise 4 sidewalls having inlet and outlet ports 7-10; a heat transfer package 11 (20) having a plurality of connected rectangular planar elements 24 with corrugations 17, the planar elements being folded in an accordion-like manner; wherein the

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corrugations 17 extend at any angle with respect to the net flow path for the purpose of achieving a desired flow resistance or pressure drop (column 3, lines 24-30).

Since ACV and Hultgren are both from the same field of endeavor and/or analogous art, the purpose disclosed by Hultgren would have been recognized in the pertinent art of ACV.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in ACV corrugations extending at any angle with respect to the net flow path for the purpose of achieving a desired flow resistance or pressure drop as recognized by Hultgren.

Regarding claims 7-8 and 10-11, Hultgren discloses top and bottom end covering elements 13 (Figure 1, column 3, line 67 to column 4, line 2).

Response to Arguments

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant's remarks with respect to Hultgren are not persuasive. Applicant's remarks are not commensurate in scope with the claims, since the claims do not recite the specific fluid media. The secondary reference of Hultgren discloses (column 7, lines 31-34) liquid media can be used. In full context, Hultgren discloses (column 1, lines 40-42) "Turbulence,

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however, must not be created *since this results in high pressure drop at high heat exchange constants.*" Clearly, Hultgren recognized, as any person having ordinary skill in the art of heat exchange or thermodynamics would, that a balance exists between pressure drop and heat transfer efficiency. A large pressure drop has power and economical considerations with a high heat transfer efficiency. The large pressure drop caused by turbulence requires a stronger pump or blower source, which costs more. The increased turbulence effectively reduces the thermal boundary layer on the heat transfer wall, which improves the heat transfer efficiency. Similarly, the increased residence time of the fluid media in the heat exchanger provides a more thorough transfer of heat therebetween. Conversely, a low pressure drop requires less power and provides a low heat transfer efficiency. One of ordinary skill in the art would design a heat exchanger considering the weight of pressure drop and heat exchange efficiency. Hultgren does not state "efficient gaseous medium heat exchange occurs at the upper edge of laminar flow, and that if turbulence occurs, efficiency drops rapidly," nor "minimal corrugations which are set at 5-20 degrees to the direction of flow (column 3, lines 3-9) to prevent turbulence and minimize pressure drop." Proper citations are requested. If anything, Hultgren discloses minimizing turbulence with respect to the wall inclination of the corrugations. Furthermore, Hultgren discloses (column 3, lines 24-25) "The invention is not, however, limited to said angle between the profiles and the flow direction." Thus, Hultgren is not concerned with turbulence consequences due to the angle between the profiles and the flow direction, although a preference of 5 degrees is disclosed. It is unclear what applicant means

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by “spaced apart out of contact with each other, rather than being adjacent to each other (bottom of page 6).” Adjacent by definition does not mean direct contact, rather nearby in proximity. Furthermore, the claims do not recite the planar elements are in contact with one another.

Regarding applicant’s remarks with respect to ACV, the primary reference of ACV does not “disclose[s] *only* a heat exchange apparatus formed from corrugated paper impregnated with thermo-plastic resin.” As noted above and in the previous Office actions, ACV discloses more than just the cursory remarks above. ACV discloses all the claimed limitations except corrugations greater than 45 degrees with respect to the longitudinal flow direction. Applicant’s remarks are not commensurate in scope with the claims, since the claims do not recite the specific material of the planar elements. In fact, applicant discloses almost any suitable material may be used. Clearly, in the art of air to air heat exchangers, which applicant portrayed as the environment in the interview on March 28, 2001, both moisture and heat exchange are main concerns.

The examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or *motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art*. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). Clearly, both ACV and Hultgren are related to air to air heat exchangers

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composed of accordion-like planar elements having corrugated patterns. Applicant is merely picking and choosing specific disclosures of the references to teach nonobvious, especially when the combined teachings of the references as whole is relied upon to meet the instant invention as claimed. One of ordinary skill in the art would combine the references as suggested with the knowledge generally available, as noted above and applicant's remarks (page 7, paragraph 3).

The Examiner appreciates the problem sought to be solved by the instant invention, i.e. balanced flow distribution. However, the claims do not reflect this discovery, only to the extent of the angle of the corrugated patterns. There is no requirement that the combination of references must recognize or solve the same problem addressed by applicant. The similar structure of the combination of references is believed to function in a manner similar to applicant's instant invention as claimed, and will inherently solve applicant's same problems. Furthermore, it is noted that the features upon which applicant relies (i.e. balance flow distribution) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry of a general nature, relating to the status of this application or clerical nature (i.e. missing or incomplete references, missing or incomplete Office actions or forms) should be directed to the Technology Center 3700 Customer Service whose telephone number is (703) 306-5648.

Any inquiry concerning this Office action should be directed to Leonard R. Leo whose telephone number is (703) 308-2611.

Leonard R. Leo
LEONARD R. LEO
PRIMARY EXAMINER
ART UNIT 3743

May 29, 2002